

# The role of gauge invariance in single-spin asymmetries

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The Sivers effect is a possible source for many single spin asymmetries. The appearance of the Sivers distribution function is also a testingground for our understanding of universality. A well-known example of the peculiar universality property of this function is the relative sign difference of the Sivers function in SIDIS and Drell-Yan scattering. This opposite sign is a direct consequence of the initial or final state interactions that give rise to the future (SIDIS) and past (Drell-Yan) pointing Wilson lines in the Sivers distribution function. The Wilson lines are path-ordered exponentials with process-dependent integration paths in the case of transverse momentum dependent functions. When going beyond the basic electromagnetic scattering processes these Wilson lines can become quite complicated structures. In turn, this observation has consequences on the universality of the transverse momentum dependent Sivers functions, that are still today not fully understood. However, the complicated Wilson lines also have well-defined consequences for the transverse moment of the Sivers function. In particular, they lead to precise predictions for certain single-spin asymmetries of which experimental verification or falsification would test our understanding of the underlying principles. We will present two such observables, i.e. specific weighted azimuthal asymmetries in hadronic back-to-back jet or photon+jet production.

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